

0051545

Thermo Nutech
W.O. No. N9-05-053-7123

Bechtel Hanford Inc.
SDG H0402

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0402 is composed of two solid samples designated under SAF No. B99-060 with a Project Designation of: FRAD Smears - 100KE/KW.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. All results were transmitted to Bechtel Hanford via fax on June 7, 1999.

2.0 ANALYSIS NOTES

2.3 Isotopic Plutonium Analyses

No problems were encountered during the processing of the samples.

2.4 Gamma Scan Analyses

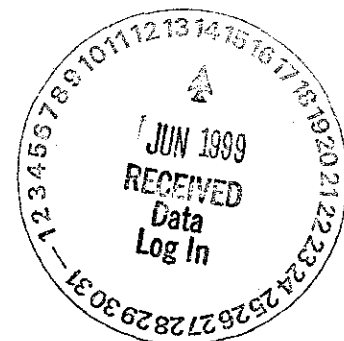
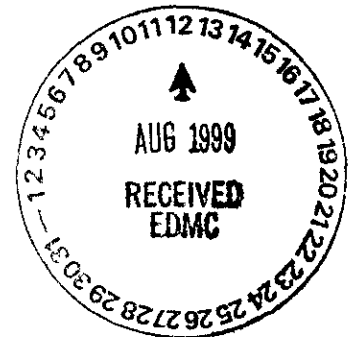
The sample aliquot was reduced due to the sample matrix resulting in an increase in the MDA achieved for this analysis. No other problems were encountered during the processing of the samples.

2.5 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.6 Gross Alpha Analyses

No problems were encountered during the processing of the samples.



TMA/RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

SAMPLE SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
BOVFM9	100 KE/KW	FILTERS		N905053-01	B99-060	B99-060-01	04/06/99 10:05
BOVFNO	100 KE/KW	FILTERS		N905053-02	B99-060	B99-060-01	04/06/99 10:00
Method Blank		FILTERS		N905053-04	B99-060		
Lab Control Sample		FILTERS		N905053-03	B99-060		
Duplicate (N905053-01)	100 KE/KW	FILTERS		N905053-05	B99-060		04/06/99 10:05

SAMPLE SUMMARY

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 06/09/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

QC SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	DEPARTMENT SAMPLE ID
7123	B99-060-01	B0VFM9	FILTERS	100.0			05/12/99 36	N905053-01	7123-001
		B0VFNO	FILTERS	100.0			05/12/99 36	N905053-02	7123-002
		Method Blank	FILTERS					N905053-04	7123-004
		Lab Control Sample	FILTERS					N905053-03	7123-003
		Duplicate (N905053-01)	FILTERS	100.0			05/12/99 36	N905053-05	7123-005

QC SUMMARY

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 06/09/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-PIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Alpha Spectroscopy										
TH	FILTERS	Thorium, Isotopic in Filters	6880-076	5.0	2			1	1	1/1
U	FILTERS	Uranium, Isotopic in Filters	6880-076	5.0	2			1	1	1/1
Gas Proportional Counting										
88A	FILTERS	Gross Alpha in Filters	6880-076	15.0	2			1	1	1/1
Gamma Spectroscopy										
GAM	FILTERS	Gamma Scan	6880-076	15.0	2			1	1	1/1

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
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Version 3.06
Report date 06/09/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

WORK SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

CLIENT SAMPLE ID		LAB SAMPLE ID											
LOCATION	MATRIX	COLLECTED		SUF-									
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD				
BOVFM9		N905053-01	7123-001	88A/88		06/02/99	06/07/99	TAH	Gross Alpha in Filters				
100 KE/KW		04/06/99	7123-001	GAM		05/23/99	06/09/99	TAH	Gamma Scan				
B99-060-01	B99-060	05/12/99	7123-001	TH		06/04/99	06/07/99	TAH	Thorium, Isotopic in Filters				
			7123-001	U		06/04/99	06/07/99	TAH	Uranium, Isotopic in Filters				
BOVFN0		N905053-02	7123-002	88A/88		06/02/99	06/07/99	TAH	Gross Alpha in Filters				
100 KE/KW		04/06/99	7123-002	GAM		05/19/99	06/09/99	TAH	Gamma Scan				
B99-060-01	B99-060	05/12/99	7123-002	TH		06/04/99	06/07/99	TAH	Thorium, Isotopic in Filters				
			7123-002	U		06/04/99	06/07/99	TAH	Uranium, Isotopic in Filters				
Method Blank		N905053-04	7123-004	88A/88		06/04/99	06/07/99	TAH	Gross Alpha in Filters				
			7123-004	GAM		05/20/99	06/09/99	TAH	Gamma Scan				
	B99-060		7123-004	TH		06/05/99	06/07/99	TAH	Thorium, Isotopic in Filters				
			7123-004	U		06/04/99	06/07/99	TAH	Uranium, Isotopic in Filters				
Lab Control Sample		N905053-03	7123-003	88A/88		06/03/99	06/07/99	TAH	Gross Alpha in Filters				
			7123-003	GAM		05/19/99	06/09/99	TAH	Gamma Scan				
	B99-060		7123-003	TH		06/05/99	06/07/99	TAH	Thorium, Isotopic in Filters				
			7123-003	U		06/04/99	06/07/99	TAH	Uranium, Isotopic in Filters				
Duplicate (N905053-01)		N905053-05	7123-005	88A/88		06/04/99	06/07/99	TAH	Gross Alpha in Filters				
100 KE/KW		04/06/99	7123-005	GAM		05/21/99	06/09/99	TAH	Gamma Scan				
	B99-060	05/12/99	7123-005	TH		06/05/99	06/07/99	TAH	Thorium, Isotopic in Filters				
			7123-005	U		06/05/99	06/07/99	TAH	Uranium, Isotopic in Filters				

COUNTS OF TESTS BY SAMPLE TYPE											
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
88A/88	B99-060	Gross Alpha in Filters	ASTM 1943-90, EPA 900	2			1	1	1		5
GAM	B99-060	Gamma Scan	GAMMAHI	2			1	1	1		5
TH	B99-060	Thorium, Isotopic in Filters	THPLATE	2			1	1	1		5
U	B99-060	Uranium, Isotopic in Filters	UPLATE	2			1	1	1		5
TOTALS				8			4	4	4		20

WORK SUMMARY

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
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T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0402

N905053-04

Method Blank

M E T H O D B L A N K

SDG <u>7123</u>	Client/Case no <u>Hanford</u>	SDG-H0402
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N905053-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7123-004</u>	Material/Matrix <u>FILTERS</u>	
	SAF No <u>B99-060</u>	

ANALYTE	CAS NO	RESULT pCi/smp	2σ ERR (COUNT)	MDA pCi/smp	RDL pCi/smp	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.049	0.11	0.29		U	88A
Uranium 233/234	U-233/234	0	0.026	0.098	0.30	U	U
Uranium 235	15117-96-1	0.031	0.031	0.12	0.30	U	U
Uranium 238	U-238	0.013	0.026	0.098	0.30	U	U
Thorium 228	14274-82-9	0.014	0.028	0.052		U	TH
Thorium 230	14269-63-7	0.024	0.038	0.045		U	TH
Thorium 232	TH-232	0	0.019	0.036		U	TH
Potassium 40	13966-00-2	U		220		U	GAM
Cobalt 60	10198-40-0	U		15	0.050	U	GAM
Cesium 137	10045-97-3	U		17	0.050	U	GAM
Europium 152	14683-23-9	U		42	0.10	U	GAM
Europium 154	15585-10-1	U		42	0.10	U	GAM
Europium 155	14391-16-3	U		32	0.10	U	GAM
Americium 241	14596-10-2	U		32		U	GAM
Uranium 238	U-238	U		1900		U	GAM
Uranium 235	15117-96-1	U		55		U	GAM

FRAD Smears - 100 KE/KW

QC-BLANK 30755

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0402

N905053-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7123Contact L.A. JohnsonClient/Case no Hanford SDG-H0402Case no TRB-SBB-207925Lab sample id N905053-03Dept sample id 7123-003Client sample id Lab Control SampleMaterial/Matrix FILTERSSAF No B99-060

ANALYTE	RESULT pCi/smp	2 σ ERR (COUNT)	MDA pCi/smp	RDL pCi/smp	QUALI- FIERS	TEST	ADDED pCi/smp	2 σ ERR pCi/smp	REC %	3 σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	20.7	1.5	0.31			88A					
Uranium 233/234	4.36	0.62	<u>0.32</u>	0.30		U	4.90	0.20	89	79-121	80-120
Uranium 235	3.58	0.55	0.099	0.30		U	3.89	0.16	92	77-123	80-120
Uranium 238	4.91	0.67	0.30	0.30		U	4.75	0.19	103	77-123	80-120
Thorium 228	-0.009	0.028	0.063		U	TH					
Thorium 230	5.29	0.45	0.045			TH	5.10	0.20	104	84-116	
Thorium 232	0.033	0.028	0.036		U	TH					
Potassium 40	U		110		U	GAM					
Cobalt 60	220	22	<u>9.8</u>	0.050		GAM	226	9.0	97	73-127	80-120
Cesium 137	255	21	<u>13</u>	0.050		GAM	260	10	98	74-126	80-120
Europium 152	U		<u>26</u>	0.10	U	GAM					
Europium 154	U		<u>23</u>	0.10	U	GAM					
Europium 155	U		<u>20</u>	0.10	U	GAM					
Americium 241	U		19		U	GAM					
Uranium 238	U		1500		U	GAM					
Uranium 235	U		30		U	GAM					

FRAD Smears - 100 KE/KW

QC-LCS 30754

LAB CONTROL SAMPLES

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Lab id TMANCProtocol HanfordVersion Ver 1.0Form DVD-LCSVersion 3.06Report date 06/09/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0402

N905053-05

BOVFM9

DUPLICATE

SDG <u>7123</u>		Client/Case no <u>Hanford</u>		SDG <u>H0402</u>
Contact <u>L.A. Johnson</u>		Case no <u>TRB-SBB-207925</u>		
DUPLICATE		ORIGINAL		
Lab sample id <u>N905053-05</u>	Lab sample id <u>N905053-01</u>	Client sample id <u>BOVFM9</u>		
Dept sample id <u>7123-005</u>	Dept sample id <u>7123-001</u>	Location/Matrix <u>100 KE/KW</u>		<u>FILTERS</u>
	Received <u>05/12/99</u>	Collected <u>04/06/99 10:05</u>		
% solids <u>100.0</u>	% solids <u>100.0</u>	Custody/SAF No <u>B99-060-01</u>		<u>B99-060</u>

ANALYTE	DUPLICATE pCi/smp	2σ ERR (COUNT)	MDA pCi/smp	RDL pCi/smp	QUALI- FIERS	TEST	ORIGINAL pCi/smp	2σ ERR (COUNT)	MDA pCi/smp	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	14500	1100	170			88A	15900	1100	300		9	35	
Uranium 233/234	2350	380	<u>150</u>	0.30		U	2240	400	<u>150</u>		5	38	
Uranium 235	515	160	<u>96</u>	0.30		U	337	140	<u>100</u>		42	76	
Uranium 238	14500	1600	<u>150</u>	0.30		U	14000	1600	<u>120</u>		4	26	
Thorium 228	0	0	1.2		U	TH	-0.258	0.29	0.67	U	-		
Thorium 230	0	0	1.5		U	TH	0	0	1.1	U	-		
Thorium 232	-0.045	0.090	0.34		U	TH	-0.057	0.11	0.32	U	-		
Potassium 40	U		150		U	GAM	U		26	U	-		
Cobalt 60	U		<u>20</u>	0.050	U	GAM	U		<u>2.1</u>	U	-		
Cesium 137	U		<u>19</u>	0.050	U	GAM	U		<u>2.6</u>	U	-		
Europium 152	U		<u>44</u>	0.10	U	GAM	U		<u>6.8</u>	U	-		
Europium 154	U		<u>46</u>	0.10	U	GAM	U		<u>5.5</u>	U	-		
Europium 155	U		<u>51</u>	0.10	U	GAM	U		<u>9.9</u>	U	-		
Americium 241	U		54		U	GAM	U		18	U	-		
Uranium 238	18800	3000	1400			GAM	15700	580	330		18	42	
Uranium 235	229	78	88			GAM	162	9.5	12		34	68	

FRAD Smears - 100 KE/KW

QC-DUP#1 30756

DUPLICATES

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 06/09/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

N905053-01

B0VFM9

DATA SHEET

SDG <u>7123</u>	Client/Case no <u>Hanford</u>	SDG-H0402
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N905053-01</u>	Client sample id <u>B0VFM9</u>	
Dept sample id <u>7123-001</u>	Location/Matrix <u>100 KE/KW</u>	<u>FILTERS</u>
Received <u>05/12/99</u>	Collected <u>04/06/99 10:05</u>	
% solids <u>100.0</u>	Custody/SAF No <u>B99-060-01</u>	<u>B99-060</u>

ANALYTE	CAS NO	RESULT pCi/smp	2σ ERR (COUNT)	MDA pCi/smp	RDL pCi/smp	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	15900	1100	300			88A
Uranium 233/234	U-233/234	2240	400	<u>150</u>	0.30		U
Uranium 235	15117-96-1	337	140	<u>100</u>	0.30		U
Uranium 238	U-238	14000	1600	<u>120</u>	0.30		U
Thorium 228	14274-82-9	-0.258	0.29	0.67		U	TH
Thorium 230	14269-63-7	0	0	1.1		U	TH
Thorium 232	TH-232	-0.057	0.11	0.32		U	TH
Potassium 40	13966-00-2	U		26		U	GAM
Cobalt 60	10198-40-0	U		<u>2.1</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>2.6</u>	0.050	U	GAM
Europium 152	14683-23-9	U		<u>6.8</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>5.5</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>9.9</u>	0.10	U	GAM
Americium 241	14596-10-2	U		18		U	GAM
Uranium 238	U-238	15700	580	330			GAM
Uranium 235	15117-96-1	162	9.5	12			GAM

FRAD Smears - 100 KE/KW

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/09/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

N905053-02

BOVFNO

DATA SHEET

SDG <u>7123</u>	Client/Case no <u>Hanford</u>	SDG-H0402
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N905053-02</u>	Client sample id <u>BOVFNO</u>	
Dept sample id <u>7123-002</u>	Location/Matrix <u>100 KE/KW</u>	<u>FILTERS</u>
Received <u>05/12/99</u>	Collected <u>04/06/99 10:00</u>	
% solids <u>100.0</u>	Custody/SAF No <u>B99-060-01</u>	<u>B99-060</u>

ANALYTE	CAS NO	RESULT pCi/smp	2σ ERR (COUNT)	MDA pCi/smp	RDL pCi/smp	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	798	270	210			88A
Uranium 233/234	U-233/234	102	56	<u>71</u>	0.30		U
Uranium 235	15117-96-1	22.4	22	<u>86</u>	0.30	U	U
Uranium 238	U-238	711	180	<u>71</u>	0.30		U
Thorium 228	14274-82-9	0.146	0.17	0.26		U	TH
Thorium 230	14269-63-7	0	0	0.70		U	TH
Thorium 232	TH-232	-0.021	0.042	0.16		U	TH
Potassium 40	13966-00-2	U		230		U	GAM
Cobalt 60	10198-40-0	U		<u>15</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>14</u>	0.050	U	GAM
Europium 152	14683-23-9	U		<u>37</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>38</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>33</u>	0.10	U	GAM
Americium 241	14596-10-2	U		36		U	GAM
Uranium 238	U-238	U		2200		U	GAM
Uranium 235	15117-96-1	U		49		U	GAM

FRAD Smears - 100 KE/KW

DATA SHEETS

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
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Version <u>3.06</u>
Report date <u>06/09/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0402

Test TH Matrix FILTERS

SDG 7123

Contact L.A. Johnson

METHOD SUMMARY

THORIUM, ISOTOPIC IN FILTERS

ALPHA SPECTROSCOPY

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0402

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6880-076						
B0VFM9	N905053-01	7123-001	U	U	U	
B0VFN0	N905053-02	7123-002	U	U	U	
BLK (QC ID=30755)	N905053-04	7123-004	U	U	U	
LCS (QC ID=30754)	N905053-03	7123-003	No data U	ok	No data U	
Duplicate (N905053-01)	N905053-05	7123-005	- U	- U	- U	

Nominal values and limits from method RDLs (pCi/smp)
 FRAD Smears - 100 KE/KW

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/smp	MAX MDA smp	ALIQ smp	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-076 2σ prep error 5.0 % Reference Lab Notebook 6880 pg.76																
B0VFM9	N905053-01		1.1	0.100				60	774				59	06/04/99	06/04	SS-049
B0VFN0	N905053-02		0.70	0.100				73	774				59	06/04/99	06/04	SS-050
BLK (QC ID=30755)	N905053-04		0.052	1.00				60	412					06/04/99	06/05	SS-045
LCS (QC ID=30754)	N905053-03		0.063	1.00				61	412					06/04/99	06/05	SS-044
Duplicate (N905053-01) (QC ID=30756)	N905053-05		1.5	0.100				26	411				60	06/04/99	06/05	SS-047

Nominal values and limits from method 1.00 20-105 200

PROCEDURES	REFERENCE	THPLATE
EP-000		Data Entry and Document Preparation, rev 0
EP-001		Q.C. Preparation, rev 0
EP-003		Tracing, rev 0
EP-008		Heavy Elements Electroplating, rev 0
EP-070		Soil Dissolution, rev 0
RP-901		Thorium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD	MDA	0.68 ± 1.3
FOR 5 SAMPLES	YIELD	56 ± 35

METHOD SUMMARIES

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0402

Test U Matrix FILTERSSDG 7123Contact L.A. Johnson

METHOD SUMMARY

URANIUM, ISOTOPIC IN FILTERS

ALPHA SPECTROSCOPY

Client HanfordContract TRB-SBB-207925Case no SDG-H0402

RESULTS

	LAB	RAW	SUF-	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)			
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX	PLANCHET	233/234	235	238	1+3	2σ	2+3	2σ
Preparation batch 6880-076										
BOVFM9	N905053-01		7123-001	2240	337	14000	<u>16</u>	3	<u>2</u>	1
BOVFNO	N905053-02		7123-002	102	22.4 U	711	<u>14</u>	9	3	3
BLK (QC ID=30755)	N905053-04		7123-004	U	U	U				
LCS (QC ID=30754)	N905053-03		7123-003	ok	ok	ok				
Duplicate (N905053-01)	N905053-05		7123-005	ok	ok	ok	<u>16</u>	3	4	1
Nominal values and limits from method										
			RDLs (pCi/smp)	0.30	0.30	0.30	100		4	
FRAD Smears - 100 KE/KW							Averages	16		3

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	PWHM	DRIFT	DAYS	ANAL-		
	SAMPLE ID	TEST	FIX	pCi/smp	smp	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6880-076 2σ prep error 5.0 % Reference Lab Notebook 6880 pg.76																
B0VFM9	N905053-01			<u>150</u>	<u>0.0010</u>			70		150			59	06/01/99	06/04	SS-047
B0VFNO	N905053-02			<u>86</u>	<u>0.0010</u>			84		150			59	06/01/99	06/04	SS-048
BLK (QC ID=30755)	N905053-04			0.12	1.00			61		150				06/01/99	06/04	SS-050
LCS (QC ID=30754)	N905053-03			<u>0.32</u>	1.00			74		150				06/01/99	06/04	SS-049
Duplicate (N905053-01)	N905053-05			<u>150</u>	<u>0.0010</u>			79		153			60	06/01/99	06/05	SS-031
(QC ID=30756)																
Nominal values and limits from method				0.30	1.00			30-105		150	100		180			

PROCEDURES	REFERENCE	UPLATE
EP-060		Soil Preparation, rev 0
EP-070		Soil Dissolution, rev 0
EP-910		Uranium Purification, rev 0
EP-008		Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA <u>77</u> ± <u>150</u>
FOR 5 SAMPLES	YIELD <u>74</u> ± <u>18</u>

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 06/09/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0402

Test 88A Matrix FILTERSSDG 7123Contact L.A. Johnson

METHOD SUMMARY

GROSS ALPHA IN FILTERS

GAS PROPORTIONAL COUNTING

Client HanfordContract TRB-SBB-207925Case no SDG-H0402

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	1: Sum, Alpha Emitters PLANCHET
Preparation batch 6880-076				
BOVFM9	N905053-01	88		7123-001 16600
BOVFN0	N905053-02	88		7123-002 813
BLK (QC ID=30755)	N905053-04	88		7123-004
LCS (QC ID=30754)	N905053-03	88		7123-003
Duplicate (N905053-01)	N905053-05	88		7123-005 17400

Nominal values and limits from method RDLs (pCi/smp)
FRAD Smears - 100 KE/KW

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/smp	ALIQ smp	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-076 2σ prep error 15.0 % Reference Lab Notebook 6880 pg.76																
BOVFM9	N905053-01	88		300	<u>0.0010</u>			0		100			57	06/02/99	06/02	GRB-115
BOVFN0	N905053-02	88		210	<u>0.0010</u>			0		100			57	06/02/99	06/02	GRB-116
BLK (QC ID=30755)	N905053-04	88		0.29	1.00			33		100				06/02/99	06/04	GRB-111
LCS (QC ID=30754)	N905053-03	88		0.31	1.00			36		100				06/02/99	06/03	GRB-110
Duplicate (N905053-01) (QC ID=30756)	N905053-05	88		170	<u>0.0010</u>			0		100			59	06/02/99	06/04	GRB-112

Nominal values and limits from method 1.00 100

PROCEDURES REFERENCE ASTM 1943-90, EPA 900
EP-060 Soil Preparation, rev 0
EP-070 Soil Dissolution, rev 0
EP-170 Preparation of Solids for Gross Alpha and Gross Beta Counting, rev 1

AVERAGES ± 2 SD MDA 140 ± 270
FOR 5 SAMPLES RESIDUE 14 ± 38

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANCProtocol HanfordVersion Ver 1.0Form DVD-CMSVersion 3.06Report date 06/09/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0402

Test GAM Matrix FILTERS
SDG 7123
Contact L.A. Johnson

METHOD SUMMARY
GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6880-076					
BOVFM9	N905053-01		7123-001	U	U
BOVFNO	N905053-02		7123-002	U	U
BLK (QC ID=30755)	N905053-04		7123-004	U	U
LCS (QC ID=30754)	N905053-03		7123-003	ok	ok
Duplicate (N905053-01)	N905053-05		7123-005	- U	- U
Nominal values and limits from method					
FRAD Smears - 100 KE/KW			RDLs (pCi/smp)	0.050	0.050

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/smp	MAX MDA smp	ALIQ FAC	PREP TION	DILU- %	YIELD %	EFF min	COUNT keV	PWHM keV	DRIFT HELD	DAYS PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6880-076 2σ prep error 15.0 % Reference Lab Notebook 6880 pg.76															
BOVFM9	N905053-01		4.5	1.00					1385			47		05/23/99	JR,04,00
BOVFNO	N905053-02		25	1.00					102			43		05/19/99	JR,03,00
BLK (QC ID=30755)	N905053-04		28	1.00					101					05/20/99	JR,03,00
LCS (QC ID=30754)	N905053-03		25	1.00					102					05/19/99	JR,04,00
Duplicate (N905053-01) (QC ID=30756)	N905053-05		46	1.00					101			45		05/21/99	JR,01,00
Nominal values and limits from method															
			0.050	1.00					100			180			

PROCEDURES REFERENCE GAMMAHI
EP-060 Soil Preparation, rev 0
EP-100 Ge(Li) Preparation for Environmental Samples,
rev 0

AVERAGES ± 2 SD MDA 26 ± 29
FOR 5 SAMPLES YIELD ±

METHOD SUMMARIES

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SUMMARY DATA SECTION

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

S A M P L E S U M M A R Y

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

W O R K S U M M A R Y

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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Lab id TMNC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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SUMMARY DATA SECTION

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
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Case no SDG-H0402

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

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SUMMARY DATA SECTION

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Form DVD-RG
Version 3.06
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SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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SDG 7123
Contact L.A. Johnson

REPORT GUIDE

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Case no SDG-H0402

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

REPORT GUIDES

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SUMMARY DATA SECTION

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

R E P O R T G U I D E

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

D U P L I C A T E

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

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SUMMARY DATA SECTION

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SDG 7123
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

REPORT GUIDES

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SUMMARY DATA SECTION

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REPORT GUIDE

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Contract TRB-SBB-207925
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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

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SDG 7123
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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GUIDE, cont.

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Case no SDG-H0402

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
 - * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.
- MDAs are underlined if greater than the printed RDL.
- * Aliquots are underlined if less than the nominal value specified for the method.
 - * Preparation factors are underlined if greater than the nominal value specified for the method.
 - * Dilution factors are underlined if greater than the nominal value specified for the method.
 - * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
 - * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
 - * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

REPORT GUIDES

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SUMMARY DATA SECTION

Page 29

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0402

SDG 7123
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0402

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

REPORT GUIDES

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SUMMARY DATA SECTION

Page 30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/09/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-060-01		Page 1 of 1 <i>2/1</i>		
Collector THI RAD CON		Company Contact T.M. BROWN		Telephone No. 376-1547		Project Coordinator TRENT, SJ		Price Code 6F Data Turnaround 15 Days		
Project Designation FRAD Smears - 100KE/KW		Sampling Location 100 KE/KW		SAF No. B99-060						
Ice Chest No. SML-559		Field Logbook No. N/A		Method of Shipment FED EX.						
Shipped To TMA/RECRA		Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A						
				COA B105KE 2W23						
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage				Preservation		None				
				Type of Container		Poly Bag				
				No. of Container(s)		1				
				Volume		1g				
SAMPLE ANALYSIS				See item (1) in Special Instructions.						
Sample No.		Matrix *	Sample Date	Sample Time						
✓ B0VFM9		Other Solid	4-6-99	1005	X				K100-96-0081A	
✓ B0VFN0		Other Solid	4-6-99	1000	X				K100-96-0080H	
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Uranium; Isotopic Thorium; Gross Alpha NOTE: SAMPLE TIME IS AN APPROXIMATION.				Matrix * Soil Water Vapor Other Solid Other Liquid
Relinquished By <i>H. Veda</i>		Date/Time 5-11-99 1035	Received By <i>SIGALE</i>		Date/Time 5/11/99 1035					
Relinquished By <i>SIGALE</i>		Date/Time 5/11/99 1100	Received By FED EX.		Date/Time					
Relinquished By Fed Ex		Date/Time 5-12-99 10:10	Received By <i>TNU M. Goldenberg</i>		Date/Time 5-12-99 10:10					
Relinquished By		Date/Time	Received By		Date/Time					
LABORATORY SECTION		Received By				Title				Date/Time
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By				Date/Time

Thermo NUTech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT			
Client: <u>Beehtel Hanford Inc</u>	Date/Time received <u>5-12-99 10:10</u>		
CoC No. <u>B99-060-01</u>			
Container I.D. No. <u>SMK 559</u>	Requested TAT (Days) <u>15</u>	P.O. Received Yes [] No [<input checked="" type="checkbox"/>]	
INSPECTION			
1. Custody seals on shipping container intact?	Yes [<input checked="" type="checkbox"/>]	No []	N/A []
2. Custody seals on shipping container dated & signed?	Yes [<input checked="" type="checkbox"/>]	No []	N/A []
3. Custody seals on sample containers intact?	Yes [<input checked="" type="checkbox"/>]	No []	N/A []
4. Custody seals on sample containers dated & signed?	Yes [<input checked="" type="checkbox"/>]	No []	N/A []
5. Cooler Temperature: _____	Packing material is:		Wet [] Dry [<input checked="" type="checkbox"/>]
6. Number of samples in shipping container: <u>2</u>			
7. Number of containers per sample: <u>1</u> (Or see CoC _____)			
8. Paperwork agrees with samples?	Yes [<input checked="" type="checkbox"/>]	No []	
9. Samples have: Tape [] Hazard labels [] Rad labels [<input checked="" type="checkbox"/>] Appropriate sample labels [<input checked="" type="checkbox"/>]			
10. Samples are: In good condition [<input checked="" type="checkbox"/>] Leaking [] Broken Container [] Missing []			
11. Describe any anomalies: _____ <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 2px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 2px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 2px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 2px;"></div>			
13. Was P.M. notified of any anomalies? Yes [] No [] Date _____			
14. Received by <u>M. Goldenberg</u> Date: <u>5-12-99</u> Time: <u>10:10</u>			
LOGIN			
TNU W.O. No. _____		Group No. _____	
		Client W.O. No. _____	
PROGRAM MANAGER			
Sample holding times exceeded?		Yes [] No []	
Client Notified: Name _____		Date/time _____	

1. SHIP FROM U.S. DEPT. OF ENERGY C/O Company <u>BECHTEL HANFORD INC.</u> Address <u>1120-N, 100-N AREA</u> City, State, Zip <u>RICHLAND, WA. 99352</u> Contact <u>JEFF GALE</u> Phone <u>509-372-9701</u>				RADIOACTIVE SHIPMENT RECORD Ship: <input checked="" type="checkbox"/> Prepaid <input type="checkbox"/> Collect Via: <input type="checkbox"/> Motor <input checked="" type="checkbox"/> Air Pgr <input type="checkbox"/> UPS <input type="checkbox"/> Rail <input type="checkbox"/> Air Cargo <input type="checkbox"/> Site Carrier SHIPMENT AUTHORIZATION NUMBER		104999 Page 1 of 2																																			
2. SHIP TO Company <u>THERMO-RETECH</u> Address <u>2030 WRIGHT AVE.</u> City, State, Zip <u>RICHMOND, CALIF. 94804</u> Attention <u>LARRY JOHNSON</u> Phone <u>510-235-2633</u>				Markings Applied Radioactive - LSA <input checked="" type="checkbox"/> Radioactive - SCO <input type="checkbox"/> Type A <input type="checkbox"/> Type B with trefoil <input type="checkbox"/> LSA I <input checked="" type="checkbox"/> LSA II <input type="checkbox"/> LSA III <input type="checkbox"/> SCO I <input type="checkbox"/> SCO II <input type="checkbox"/> Labels Applied Empty <input checked="" type="checkbox"/> Radioactive White - I <input type="checkbox"/> Radioactive Yellow - II <input type="checkbox"/> Radioactive Yellow - III <input type="checkbox"/> Subsidiary Hazard <input type="checkbox"/>		For Normal Form only Identify Physical Form <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input checked="" type="checkbox"/> Solid Chemical Form <input checked="" type="checkbox"/> Elemental <input type="checkbox"/> Metal <input type="checkbox"/> Nitrate <input type="checkbox"/> Oxide <input type="checkbox"/> Mixture <input type="checkbox"/> Other																																			
5. HM Proper Shipping Name: excepted package - empty packaging 7 UN2810 excepted package - instruments or articles 7 UN2910 <input checked="" type="checkbox"/> excepted package - limited quantity of material 7 UN2910 excepted package - articles manufactured from natural or depleted uranium or natural thorium 7 UN2910 Special Form, n.o.s. 7 UN2974 Low Specific Activity, n.o.s. 7 UN2912 n.o.s. 7 UN2982 Fissile, n.o.s. 7 UN2918 Surface Contaminated Object 7 UN2913				EMERGENCY RESPONSE Telephone <u>1888-766-0771</u> Highway Route Controlled Quantity Exclusive Use Shipment <input type="checkbox"/> with instructions <input type="checkbox"/> Placards Applied <input type="checkbox"/> If Rail Specify: Fissile Excepted, Grams <u><15g</u> <input checked="" type="checkbox"/> Excepted Package Statement <input checked="" type="checkbox"/>																																					
Warning - Fissile Material Controlled Shipment: Do Not Load More Than <u>NA</u> Packages Per Vehicle. In Loading and Storage Areas, Keep at Least 20 Feet from Other Packages Bearing Radioactive Labels. <u>TOTAL VOLUME OF SAMPLE 2g</u> <u>70g</u>																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>No</th> <th>Pkg</th> <th>Model/Package</th> <th>COG/STB</th> <th>Serial No</th> <th>Seal No</th> <th>Isotopes</th> <th>Net Package</th> <th>Gr. Wt. Kg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>POLY COOLER</td> <td>STRONG-TIGHT</td> <td>SM-L-559</td> <td>TAPE</td> <td>K-40, U-235, U-238</td> <td>N/A</td> <td>3.7x10¹¹ 7 Kg</td> </tr> <tr> <td colspan="9"> POLYBAG CONTAINER, DOUBLE BAGGED, PACKED WITH PACKING PEANUTS FOR CUSHIONING. SAMPLE #s: BOX FM 9, BOX FMO </td> </tr> <tr> <td colspan="7" style="text-align: right;">TOTALS</td> <td>N/A</td> <td>3.7x10¹¹ 7 Kg</td> </tr> </tbody> </table>						No	Pkg	Model/Package	COG/STB	Serial No	Seal No	Isotopes	Net Package	Gr. Wt. Kg	1		POLY COOLER	STRONG-TIGHT	SM-L-559	TAPE	K-40, U-235, U-238	N/A	3.7x10 ¹¹ 7 Kg	POLYBAG CONTAINER, DOUBLE BAGGED, PACKED WITH PACKING PEANUTS FOR CUSHIONING. SAMPLE #s: BOX FM 9, BOX FMO									TOTALS							N/A	3.7x10 ¹¹ 7 Kg
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(Shipper may describe package in detail on one of the unused lines above)																																									
12. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. Certifier's Signature <u>[Signature]</u> On behalf of DOE-RL Date <u>5/11/99</u> Organization <u>ERC-AFS</u> Complete Cost Code (Inc. End Function) <u>B105KE2W23</u>																																									
13. Surface Dose Rate of Package <input checked="" type="checkbox"/> <0.005 or <u>N/A</u> mSv/hr Dose Rate @ 1 Meter from Surface of Package <input checked="" type="checkbox"/> <0.005 or <u>N/A</u> mSv/hr <input checked="" type="checkbox"/> <0.5 or <u>N/A</u> mrem/hr (N+B Y) <input checked="" type="checkbox"/> <0.5 or <u>N/A</u> mrem/hr (N+B Y) Additional Data and Instructions (inc. Readings on Internal Packaging) Signature - Radiation Monitoring <u>[Signature]</u>																																									
14. TRANSPORTER Vehicle Number <u>663 19584</u> DRIVER SIGNATURE <u>[Signature]</u> RECEIVER RECEIVER SIGNATURE _____ Date _____																																									
15. OFFSITE AUTHORIZATION Shipment has been inspected and verified to be in compliance with DOT regulations Authorized Signature <u>[Signature]</u> Printed Name <u>RONALD L. CLAWSON</u> Date <u>5-11-99</u>																																									
16. AUTHORIZATION FOR SHIPMENT <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="vertical-align: top;"> AIR TRANSPORT CERTIFICATION <input type="checkbox"/> N/A </td> <td style="vertical-align: top;"> CARGO AIRCRAFT <input type="checkbox"/> Cargo Aircraft Only Labels Applied </td> <td style="vertical-align: top;"> PASSENGER AIRCRAFT <input checked="" type="checkbox"/> Ltd Qty <input checked="" type="checkbox"/> Research/Medical Diagnosis <input type="checkbox"/> <3 T.I. <input type="checkbox"/> Human Medical Research </td> <td rowspan="2" style="vertical-align: top;"> Pkg. Dimensions (cm) </td> </tr> <tr> <td colspan="2"></td> </tr> </table>						AIR TRANSPORT CERTIFICATION <input type="checkbox"/> N/A	CARGO AIRCRAFT <input type="checkbox"/> Cargo Aircraft Only Labels Applied	PASSENGER AIRCRAFT <input checked="" type="checkbox"/> Ltd Qty <input checked="" type="checkbox"/> Research/Medical Diagnosis <input type="checkbox"/> <3 T.I. <input type="checkbox"/> Human Medical Research	Pkg. Dimensions (cm)																																
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